Strategic Issues for a City Roadways Re-Engineering Project

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This paper discusses the issues arising from a re-engineering project that was successfully completed in 1998. The project commenced in 1993 with the objectives of developing and implementing needs based budgeting tools, data and business processes for the road network in the City of Saskatoon. The project implemented network and project level Pavement Management Systems, a Maintenance Management System, a zero-based budgeting business process and a method to annually assess the impact of decisions on the value of the road network. The paper discusses the organizational issues addressed including: Developing re-engineering strategy; creating re-engineering teams; identifying internal champions for the change; designing needs based business processes; developing accurate measure of condition to drive all physical surface work; developing management tools and processes. The paper focuses on the critical success factors and the major lessons learnt from the total four year project.

BACKGROUND

During 1993, the City of Saskatoon participated in a world-wide review of pavement management system tools. This review culminated in a one-week seminar hosted by the University of Saskatchewan in late 1993. During this seminar, 25 of the key city personnel were exposed to modern asset management principles and practices. At the completion of the seminar, the City decided to move towards implementing pavement management systems at both the Network Level and Project Level.

This required the City to:
- design and implement a detailed condition rating process for the street network from expressways down to local streets;
- develop performance models and cost models for the actual physical performance of the network;
- develop modern business practices that would enable the City's budgetary and accounting processes to fully maximize the advantage of the new technology.

This paper focuses on the processes used to develop the new business practices.

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KEY ISSUES

After initial implementation of the tools and technology, the City identified that the core business processes of the City would have to change. Otherwise the new technology could not be successfully implemented.

Following are the key issues that needed to be addressed:
- There were varying levels of understanding of asset management principles and practices;
- There were no uniform systematic methods for work planning and delivery;
- There was no uniform process for reporting outcomes of expenditure;
- There were no program objectives or performance measures;
- There were no meaningful uniform measures of efficiency and effectiveness.

The Challenge

Council was faced with similar decisions on an annual basis about the level of investment in preserving the road assets of the City. The only measure of this core activity was the financial expenditures. There was no measure of outcomes of the expenditure of the previous years preservation budget (a mixture of a variety of budgets including parts of Capital and Operating). A new process had to include performance measures that would ensure accountability for the budgetary decisions of the City (See Figure 1).
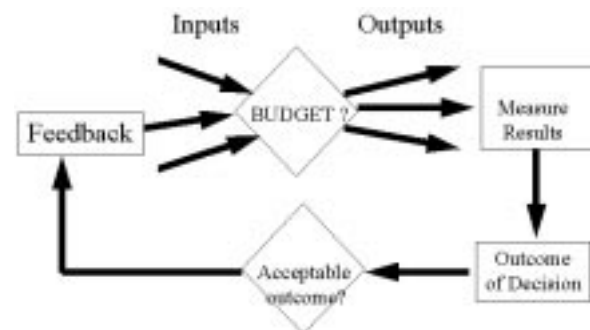

FIGURE 1 Decision process.

THE PLANNED APPROACH

In order for the City to effectively address the above issue, there was a need for a planned approach to changing the way the City does its business. The change had to be managed and objective based. There was also a key requirement that there was to be maximum input from all the internal stakeholders into the changed business process.

To facilitate the planned approach to implementing the new business processes, it was decided that the following areas need to be addressed:

1. Education
2. Identification of internal advocates and future champions of change
3. Tasks:
- Draft asset management policies
- Learn how those policies could be satisfied
- Develop procedures to enable people to comply with policies
4. Implementation training

FIGURE 2 AM Change management structure.

CHANGE MANAGEMENT STRUCTURE

The stakeholder input for this project that institutionalized the end product with maximum buy-in from the internal stakeholders consisted of the following:

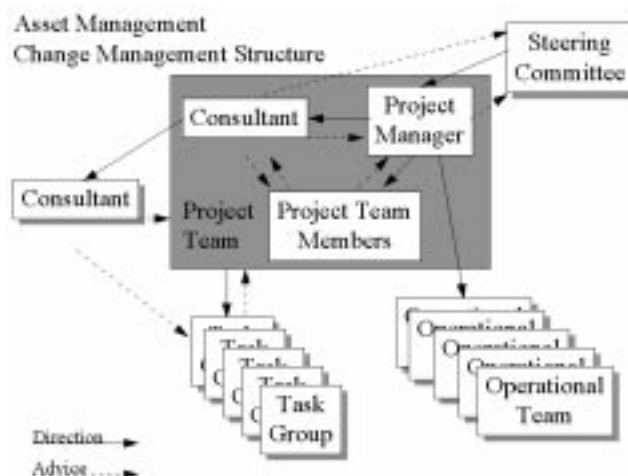| *Stakeholder Group*	*Change Management Role*
Sponsor:	
Works Committee	Ensured direction of project was consistent with City goals
	Promoted asset management at executive level of City
	Provided support for the project
Steering Committee	Confirmed the strategic direction of the project
	Removed internal/external "roadblocks" for project team
Project Manager	Managed project budget, deliverables, and time
	Co-ordinated project activities
	Reported to Steering Committee
	Provided direction on impacts across the Department
Project Team	Reviewed all starting point documents for task groups
	Reviewed all outputs from task groups
	Primary force of change
	Assessed progress of project
Task Groups	Determined "fit for purpose" solution for specific asset management needs
	Starting point defined by Project Team; reviewed by Steering Committee
Operational Groups	Performed specific activities

The above stakeholder input required in excess of 30 personnel from across the City to be involved in all aspects of the project. The description of how these groups interacted is in Figure 2.

As can be seen from the Figure, the project team members and the project manager are the key personnel that influence the outcome of the project. They are, in effect, the "engine room" of change for the overall project. The specialized input from accounting and operational fields within the City were achieved by a diverse group of people being involved in specific tasks within a task group. It is also worth noting that the consultant was part of the project team and also the consultant was external to the project team in providing advice. This meant the consultant wore two hats during the project.

The project team identified all of the implementation objectives and reviewed and/or developed all of the starting point documents for all task groups. The project objectives are discussed in a later part of this paper as are the task groups. The project team also identified the key requirements for the top three levels of management throughout the City. This was to become the project scorecard for completion of the project. The details of the project scorecard are also discussed later in the paper.

TASK GROUPS

Overall, eight task groups were identified as being needed to ensure input from the internal stakeholders regarding specific issues related to the City's processes. The eight task groups were as follows:

Task Group–Budget Process	Convert to needs based budget process
Task Group–Capitalization Team	Required knowledge of balance sheets, CICA rules.
Task Group–Performance Performance Measures	Measured efficiency, effectiveness of resultant process

Task Group 4–MMS Implementation Strategy

Task Group 5–PMS Implementation   Institutionalize the
                                    technology

Task Group 6–Communication   Develop reporting strategy
                                    to external stakeholders

Task Group 7–Role and Responsibility Review roles,
                                    responsibilities vs.
                                    policies, procedures

Task Group 8-Information Systems Support Strategy
                                    Develop ongoing support
                                    for information systems
                                    developed/implemented as
                                    part of the project.

Task groups were given a starting point document developed by the consultant and the project team and they met for several days in a closed setting to ensure unobstructed focus on the task. They were the working groups for the project and tended to have strong ownership of the results.

The task groups identified the following issues:

- Roadway preservation business must compete with all other service areas;
- Business of preservation was different from all other business in the City of Saskatoon;
- Current budget processes had absolutely nothing to do with the condition of the network;
- City needed re-engineering of the budget process and not just tinkering with budget process.

All task groups worked diligently on their allocated task. Almost all had a starting point document that defined a "straw man" business process that they could use as a starting point for their deliberations. All task groups came up with a final report or business process for their allocated tasks.

IMPLEMENTATION OBJECTIVES

At the very start of the re-engineering project, the project team and steering committee believed it was important that the overall project have firm and universally agreed-to implementation objectives that were to become the guiding principles of the project. The consultant brought to the project implementation objectives from similar re-engineering projects around the world. Those objectives were then reviewed by the project team and finalized into the nine discussed in this paper. The steering committee and the Council of the City agreed to the implementation objectives. The implementation objectives are as follows:

1. Understand Asset Management Principles and Practices

This would result in all levels from Maintenance Supervisor to Director Works and Utilities and External Stakeholders having a more uniform and modern knowledge of the practices and principles of Asset Management.

2. Be Able to Develop a Needs Based Budget for all Preservation Works

This would enable the City to determine the cost of maintaining, or of improving and degrading the current network condition or any part of the network. It was recommended the budget should include maintenance and rehabilitation works into one preservation program.

3. Communicate the Benefits of Asset Management to External Stakeholders

The City would be in a position after the implementation to articulate what had been done by the City to improve its accountability for asset management. Capitalization of the asset (determining the written-down replacement cost of the asset annually) was an example of increased accountability to external stakeholders.

4. Present Budget in an Understandable and Relevant Way to External Stakeholders

The budget must be able to be defended. Therefore, the supporting information for the budget must be able to be audited and understood by the decision-makers.

5. Develop and Implement Asset Management Policies and Procedures to Institutionalize Asset Management

Large organizations require documented policies and procedures for good things to work in the long-term. Once the initial enthusiasm has diminished and the immediate organizational priorities change, documented policies and procedures ensure the core business continues to function.

6. Respond Positively to an External Audit

Some Provincial Departments had already been subjected to a value for money audit. An external audit is an opportunity to demonstrate the level of control an organization has over its activities. At the completion of the project, the City was able to demonstrate the logic of all decisions and the links between decisions and the City's goals.

7. Fully Account for the Outcomes of the Expenditure of Asset Management Funds

This would enable the City to compare expected performance with actual performance. As an example, short and long-term targets were set for condition of the network based on various budget scenarios. After the budget had been spent, the City was able to compare the condition expected with the condition achieved.

8. Develop a Five Year Network Level Maintenance Plan

The plan would include expected improvements in decision-making as well as the predicted performance of the network. As an example, if funding were to be increased in the short term to improve the condition of certain types of pavements there may be a net reduction in overall preservation costs in the long term. The plan needed to be able to be understood by non-technical people such as politicians.

9. Be More Objective in Asset Management Processes

A high level of subjectivity appeared to be associated with many of the asset management processes within the City. This subjectivity may be the best way of making the best decisions, however, as this cannot be proved there will always be some doubt. An example of improved objectivity was the manual condition rating system that was implemented. The maintenance workforce had always inspected road conditions, however, now they were able to all do it in a more systematic and uniform way. This minimized personal bias associated with subjective decision-making. The goal was to be more objective, not totally objective. Skilled peoples' opinions will always be of value in a well run business. However, the more people involved in the process, the greater the need for Quality Assurance of processes.

PROJECT SCORECARD

In order to move from the high level project objectives to some tangible set of specific objectives that could be understood by the large cross-section of people involved in the project, the project team and consultant developed a list of questions that were believed to be questions that one of three levels of management could reasonably be expected to ask. The new business processes and technology should enable each of those questions to be answered. This, therefore, became the project scorecard and much of the focus of the design of the business processes had to do with being able to provide answers to the questions. The questions were stratified into three levels, the highest level being the Council requirements. The Council is the elected representative of the City. They are responsible for all the executive decision-making of the City. The Council does have an active involvement in the management decisions of the City.

The next level of management was the Director of Works and Utilities. This position was the most senior engineering position within the City and was responsible for all the technical aspects of the operations of the City. The questions developed for this level of management were structured to be appropriate for the current business needs of that level of management. The third level was the Engineering Department Requirements which is the tactical level of the City's operations. Much of the short and medium term planning was the responsibility of this level of management. Delivery of services was also a key accountability of this level of management. Therefore, again, the questions were structured accordingly.

Council Requirements

To determine if an asset management framework was viable, the following questions needed to be addressed:
- What does the road network needs in terms of public money to ensure responsible allocation of limited resources for the overall good of the community?
- How much money is required to maintain current condition on certain roads whilst improving condition on others?
- What value for money did the community receive from the expenditure of funds on preservation works?
- What is the value of the infrastructure?
- What impact do the decisions of council have on the value of the road network?
- What is the impact of funding or resource constraints on the long-term condition of the road asset?
- Are we creating problems for future generations by our current actions?
- How will the condition of the asset change with different budget levels?

Director Works and Utilities Requirements

To determine if MMS and PMS were viable the following questions needed to be addressed:
- What is the current and future condition of the asset in relative terms?
- What funds are required now and in the future to maintain the network at a given standard?
- How are the various sub-elements of my network performing?
- What injection of funds is needed to improve condition and where should it be allocated for maximum effectiveness?
- What additional level of funds would be required if a short term reduction in preservation funding were imposed?
- Are standard methods applied to all preservation activities uniformly across the City?
- Are all preservation actions both effective and efficient?

Engineering Department Requirements

To determine if MMS and PMS were viable the following questions needed to be addressed:
- Where is potential for most effective expenditure of funds?
- How good or bad is any part of network compared to the rest of network?
- Most effective program requirements for manpower, plant and materials, and are these viable?
- What treatments are available and what are their consequences?
- What is most cost effective treatment for a particular segment?
- What are repercussions of changing the work program?
- Are all activities planned and budgeted to ensure optimal use of financial resources?
- Are all preservation activities performed at a better productivity than last year?

- Is at least 80% of completed preservation work program in accordance with original work program?
- Are work plans for crews consistent with overall preservation work plans for the City?
- Can the Engineering Department demonstrate that it is doing a good job in asset management?

CONCLUSIONS

Due to the massive scale of change and the vast level of resources required to deliver the project effectively, the project was identified as a long-term project. This meant that the overall project of re-engineering was to occur over multiple years. The complete re-engineering project commenced in 1995 and, at the stage of writing this paper, all the business processes have been designed and charted. Many of the policies and procedures have been documented and a full quality assured condition rating process has been implemented. Also, the City has moved towards documented standard work practices for all of the operational field staff covering all the physical assets of the City from Roadways through to Water & Sewer, Parks and Transportation branches.

The work that the Roadways branch of the City has done in the re-engineering project has been seen as a showcase for other branches. Much of the work that has been done for Roadways is now being reviewed and adapted to the other branches of the City.

It is anticipated that the project will be completed in 1998 with full documentation of all the policies, procedures and standards for the business process being presented to Council for ratification in an Asset Management Manual. The manual will include all the business processes that have been designed in the project.

It is worth noting that much of the new approach to managing the asset has already been implemented by City management, even prior to finalization of all the details.